(12) UK Patent Application (19) GB (11) 2 288 860 (13) A

(43) Date of A Publication 01.11.1995

(21) Application No 9408579.2

(22) Date of Filing 29.04.1994

(71) Applicant(s)
Alan James Adams
65 Wood Lane, Short Heath, WILLENHALL,
West Midlands, WV12 5NF, United Kingdom

(72) Inventor(s)
Alan James Adams

(74) Agent and/or Address for Service
Swindell & Pearson
48 Friar Gate, DERBY, DE1 1GY, United Kingdom

(51) INT CL[6]
F16L 33/00

(52) UK CL (Edition N )
F2G G24B G24B5 G28 G5D3
U1S S1968

(56) Documents Cited
GB 2119465 A US 5143408 A US 4875719 A
US 4597594 A US 4553587 A US 4257629 A

(58) Field of Search
UK CL (Edition N ) F2G G24B G5D3
INT CL[6] F16L 25/00 31/00 31/02 33/00 55/16
ONLINE : WPI

# (54) A connector for connecting pipes of different diameters

(57) A connector for connecting pipes of different diameters, for example hoses in a vehicle cooling system, comprises a central flexible conduit 12 having connection means 14, 16 at either end. At least one of the connection means 14, 16 comprises a plurality of pipes 14A, 14B, 14C, 16A, 16B, 16C arranged one after the other, each successive pipe being narrower than the previous pipe whereby the diameter of the end of the connector may be selected by removing one or more of the pipes. Lines of weakness or tear-away strips can be formed between the pipes to aid in their removal.

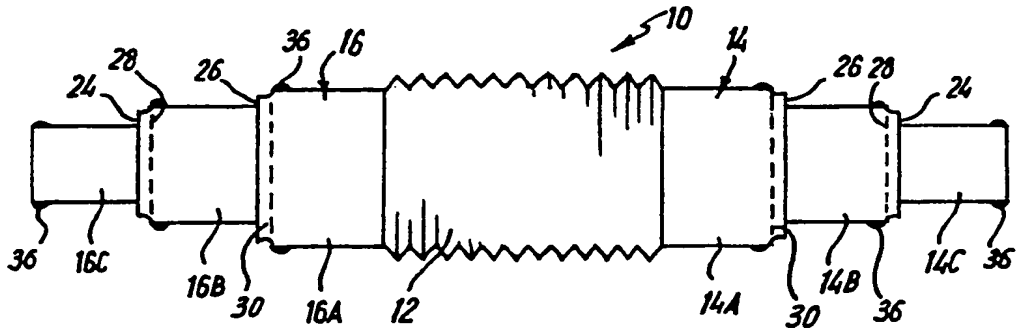


FIG.1

GB 2 288 860 A

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

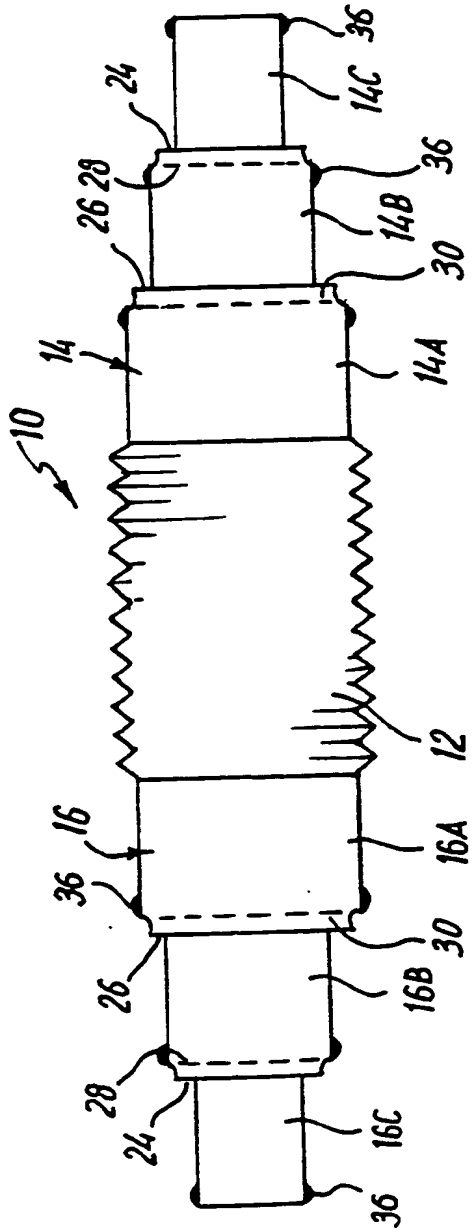


FIG.1

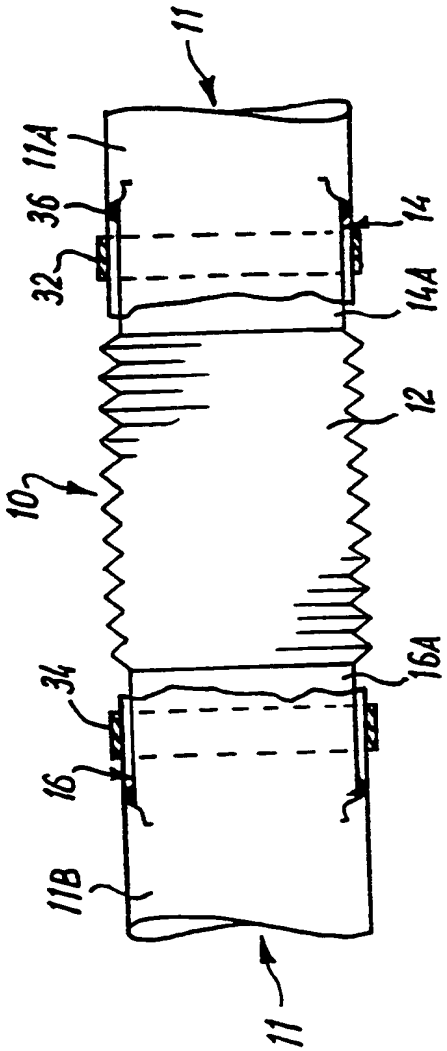


FIG.2

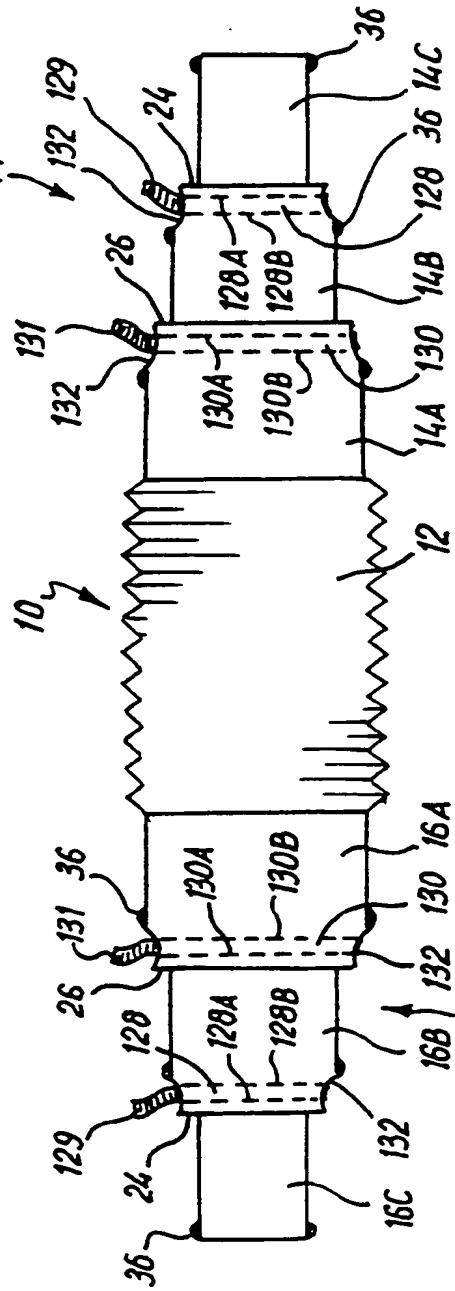


FIG. 3

# Improvements in or Relating to Connectors

This invention relates to connectors. More particularly, but not exclusively, this invention relates to connectors for use in connecting split or worn hoses, for example hoses for coolants in vehicles, industrial machines and the like.

Coolant hoses for vehicle engines are subject to damage and/or wear. Holes may form in the hoses through which coolant can leak. When such wear occurs, it is necessary to replace the hose which is worn.

It is an object of this invention to obviate and/or mitigate this disadvantage.

According to this invention, there is provided a connector for connecting a first conduit to a second conduit, the connector comprising a central conduit having first and second ends, first connection means provided at the first end of the central conduit and adapted to be connected to the first conduit, and second connection means provided at the second end of the central conduit and adapted to be connected to the second conduit, wherein at least one of the first and second connection means comprises a plurality of pipes arranged one after the other on the central conduit, each successive pipe being narrower than the previous pipe,

whereby the diameter of the end of the connector may be selected by removing one or more of the pipes.

Preferably, the pipes are substantially cylindrical. They may be attached to each other at regions of weakness. Alternatively, the pipes may be attached to each other at strips extending around the pipes. Each strip may be provided with a tag whereby upon pulling the tag, the respective strip can be removed from the pipe thereby separating the pipes from each other. The strips may be attached to the pipes by at the end region thereof, preferably, lines of weakness.

The central conduit may be formed of a flexible material. Each pipe may be so sized as to be capable of fitting over the first or second conduit to which it is to be connected.

Preferably, each pipe adjacent the central conduit is wider than the pipes remote from the central conduit, the width of said pipes decreasing away from the central conduit. When it is desired to connect the connector to a first or second conduits of a size suitable for connection to said pipe adjacent the central conduit, the pipe or pipes remote from said central conduit can be removed, preferably at said lines of weakness.

Appropriate clips may be used to fasten the pipes to the appropriate conduits.

Preferably there are at least three pipes at each end, although it will be appreciated that any desired number, for example five or seven, of connection tubes.

Embodiments of the invention will now be described by way of example only with reference to the accompanying drawings in which:-

Fig. 1 is a schematic side view of a connector;

Fig. 2 shows the connector in use; and

Fig. 3 is a schematic side view of a further embodiment of a connector.

Referring to the drawings, there is shown a connector 10 for connecting together first and second conduits in the form of ends 11A,11B of a coolant hose 11 (see Fig. 2). Alternatively, the ends 11A,11B may be inlets or outlets between which a coolant hose must be connected, such as inlets or outlets of manifolds, radiators etc. in a vehicle engine. The connector 10 comprises a central conduit 12 formed of an appropriate

flexible plastics material. Alternatively, the central conduit could be formed of a firm plastics material. First and second connecting means 14,16 are attached to each end of the central conduit 12.

The connection means 14,16 comprises a plurality of pipes 14A,14B,14C and 16A,16B,16C. Each of the pipes 14A to C and 16A to C are substantially cylindrical in configuration. In the embodiment shown, the pipes 14A and 16A are substantially equal in diameter, as are, respectively, the pipes 14B and 16B, and the pipes 14C and 16C. The pipes 14A and 16A attached to the central conduit 12 are of substantially the same diameter as the central conduit 12. The pipes 14B and 16B are attached respectively to the pipes 14A and 16A and have a diameter which is less than that of the pipes 14A,16A. The pipes 14C,16C are attached to the pipes 14B,16B and have a diameter which is less than that of the pipes 14B,16B.

Although the connection means 14,16 has been shown as comprising three pipes in Fig. 1, it will be appreciated that any appropriate number of pipes could be provided.

Each pipe 14B to C and 16B to C is attached to its adjacent pipe(s) by appropriate attachment flanges 24,26

which are provided with regions of weakness, 28,30, formed for instance by scoring.

Referring to Fig. 2, there is shown the connector 10 in use. When it is desired to connect together two tubes, for example two ends 11A,11B of a worn coolant hose in a vehicle, the coolant hose is first cut to define the two ends 11A,11B and measured to determine its diameter. Alternatively, if the connector 10 is to connect existing items 11, such as radiators, existing hoses are removed and the diameters at 11 are measured. The connection means 14,16 are then cut at the appropriate regions 28 or 30 of weakness to leave ends which will provide a snug fit inside the ends 11A,11B to be connected together. In the illustrated case, the pipes 14A,16A are of an appropriate diameter. The connection can be broken or sawn by an appropriate hacksaw at the regions of weakness 30 so that the pipes 14B to C and 16B to C not required can be discarded. Once the pipes 14B to C and 16B to C have been removed, appropriate fastening means, for example jubilee clips 32,34 (shown in dotted lines) can be passed over the ends 11A and 11B of the hose. The ends 11A,11B of the hose can be fitted onto the appropriate pipe 14A and 16A and the jubilee clips 32,34 tightened to attach the ends 11A,11B of the hose onto the pipes 14A,16A.

Although the above description has referred only to the pipes 14A,16A, a similar mode of operation also applies for the pipes 14B or 14C and 16B or 16C, when these pipes are of appropriate sizes. Raised portions 36 extending around the ends of each of the pipes 14A to C and 16A to C engage the ends 11A,11B of the hose to hold the ends 11A,11B in place.

Various modifications can be made without departing from the scope of the invention, for example, the length of the connector could be varied as could the number of pipes and their sizes. Also, the connector could be used to connect together hoses of different diameters, but cutting the connector at different positions at the two ends.

An alternative embodiment of the invention is shown in Fig. 3 which possess many of the features of the embodiments shown in Figs. 1 and 2, and these features have been designated with the same reference numeral.

The embodiment shown in Fig. 3 differs from the embodiment shown in Figs. 1 and 2 in that the regions of weakness 28,30 in the embodiments shown in Figs. 1 and 2, have been replaced by strips 128,130. The strips 128,130 are provided with tags 129,131. The strips 128,130

extend around the circumference of the pipes 16B,16A (or 14B,14A) respectively whereby upon pulling the tags 129 or 131, the strips 128 or 130 can be pulled away from the respective pipe 16B,16A (or 14B,14A).

Lines of weakness 128A and 130A are provided around the strips 128,130 to facilitate removing the strips from the pipes.

As can be seen from Fig. 3, the strips 128,130 are arranged within a concavity 132 extending around the pipes 14A,14B,16A,16B, and it will be appreciated that the tags 129,131 may lie within the concavities 132 and be substantially flush with the outer surfaces of the pipes 14A,14B,16A,16B.

Whilst endeavouring in the foregoing specification to draw attention to those features of the invention believed to be of particular importance it should be understood that the Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.

## Claims

1. A connector for connecting a first pipeline to a second pipeline, the connector comprising a central conduit having first and second ends, first connection means provided at the first end of the central conduit and adapted to be connected to the first pipeline, and second connection means provided at the second end of the central conduit and adapted to be connected to the second pipeline, to allow communication between the first and second pipelines, wherein at least one of the first and second connection means comprises a plurality of pipes arranged one after the other on the central conduit, each successive pipe being narrower than the previous pipe, whereby the diameter of at least one end of the connector may be selected by removing one or more of the pipes.

2. A connector according to Claim 1 wherein the pipes are attached to each other at regions of weakness.

3. A connector according to Claim 1 wherein the pipes are attached to each other at strips extending around the pipes, each strip being provided with a tag whereby upon pulling the tag, the respective strip can be removed from the pipe thereby separating the pipes from each other.

4. A connector according to any preceding claims wherein the central conduit is formed of a flexible material.

5. A connector according to any preceding claims wherein each pipe is so sized as to be capable of fitting over the first or second conduit to which it is to be connected.

6. A connector according to any preceding claims wherein the width of each successive pipe decreases the further from the central conduit each pipe is arranged.

7. A connector according to any preceding claim wherein each pipe is substantially cylindrical.

8. A connector according to any preceding claim wherein there are at least three pipes at each end.

9. A connector substantially as herein described with reference to and as shown in the accompanying drawings.

10. Any novel subject matter or combination including novel subject matter herein disclosed, whether or not within the scope of or relating to the same invention as any of the preceding claims.

10

**Patents Act 1977**
**Examiner's report to the Comptroller under Section 17**
**(The Search report)**

Application number
GB 9408579.2

**Relevant Technical Fields**

(i) UK Cl (Ed.N) F2G G5D3, G24B;

(ii) Int Cl (Ed.6) F16L 25/00, 31/00, 31/02, 33/00, 55/16;

Search Examiner
PHIL THORPE

Date of completion of Search
5 JULY 1995

**Databases** (see below)
(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ONLINE: WPI

Documents considered relevant following a search in respect of Claims :-
1-7

**Categories of documents**

**X:** Document indicating lack of novelty or of inventive step.

**Y:** Document indicating lack of inventive step if combined with one or more other documents of the same category.

**A:** Document indicating technological background and/or state of the art.

**P:** Document published on or after the declared priority date but before the filing date of the present application.

**E:** Patent document published on or after, but with priority date earlier than, the filing date of the present application.

**&:** Member of the same patent family; corresponding document.

| Category | Identity of document and relevant passages | | Relevant to claim(s) |
|---|---|---|---|
| X | GB 2119465 A | (UNIFLEX) see Figures 1 and 2 | 1, 5, 6, 8 |
| X | US 5143408 A | (HOLTSMARK) see whole document | 1, 4, 6, 7, 8 |
| X | US 4875719 A | (MYLETT) see column 1 lines 49-55 and column 3 lines 16-20 | 1, 5, 6, 8 |
| X | US 4597594 A | (KACALIEFF ET AL) see Figure 1 | 1, 5, 6, 8 |
| X | US 4553587 A | (TRAYLOR) see column 4 lines 22-34 and 57-60 | 1, 5, 6, 7 |
| X | US 4257629 A | (MAPLE ET AL) see column 4 lines 1-14, Figures 7 and 8 | 1, 5, 6, 8 |

Databases:The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).